

Name: _____ Date: _____

Polynomial Operations EXAM (version 202)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = 8x^5 - 10x^4 + 9x^2 + 4x - 5$$

$$q(x) = 5x^5 - 9x^4 + x^3 + 6x^2 + 10$$

Express the sum of $p(x) + q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = -2x^2 + 3x + 4$$

$$b(x) = -6x + 4$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^6$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= -3x^3 + 27x^2 + x - 12 \\g(x) &= x - 9\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 9}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = -3x^3 + 27x^2 + x - 12$. Evaluate $f(9)$.